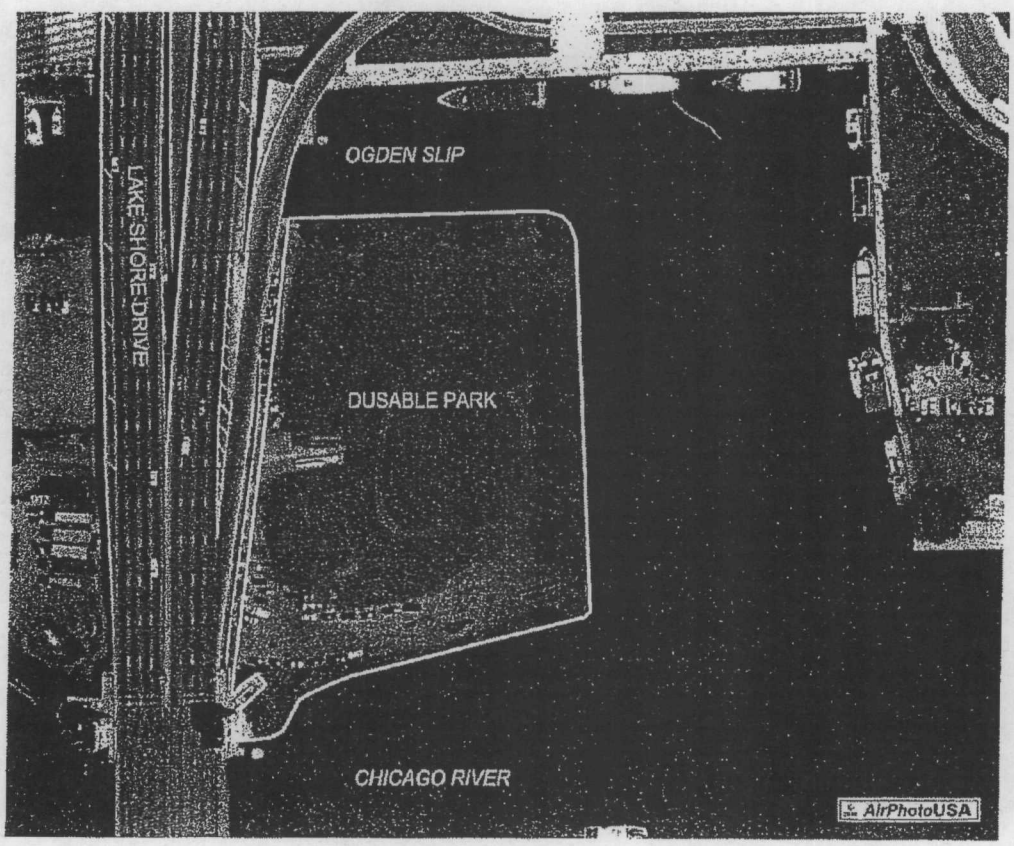
COLLINS ENGINEERS INC.

UNDERWATER INVESTIGATION
OF THE
DUSABLE PARK DOCKWALL
ALONG THE
MAIN BRANCH OF THE CHICAGO RIVER
IN
CHICAGO, ILLINOIS



APRIL 2005

PREPARED FOR

KUDRNA & ASSOCIATES, LTD.

Appendix H

Underwater Investigation of the DuSable Park Dockwall

UNDERWATER INVESTIGATION

OF THE

DUSABLE PARK DOCKWALL

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IN

CHICAGO, ILLINOIS

APRIL 2005

Prepared For:
KUDRNA & ASSOCIATES, LTD.

Prepared by:
COLLINS ENGINEERS, INC.
123 North Wacker Drive, Suite 300
Chicago, IL 60606

COLLINS JOB NO. 4372

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UNDERWATER INVESTIGATION

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IN

CHICAGO, ILLINOIS

1.0 INTRODUCTION

1.1 Purpose and Scope

This report consists of the results of a detailed underwater investigation of DuSable Park Dockwall along the Main Branch of the Chicago River in Chicago, Illinois.

Collins Engineers, Inc. conducted the underwater investigation for Kudrna & Associates, LTD. (Kudrna) on April 7, 2005. The work performed included a detailed inspection of the substructure components located in the water at the time of the investigation from the waterline to the channel bottom. In addition, a brief inspection was also made of those areas above the waterline that could be submerged during periods of higher water. Soundings of the channel bottom were taken along the face of the dockwall and 20 feet from the dockwall at 50-foot increments. Two excavations were also performed adjacent to the dockwall on July 19, 2005 to determine the condition and configuration of the wall anchorage system.

The following report includes a description of the structure, the method of investigation, a description of existing conditions, and an evaluation and recommendations based on the findings.

1.2 General Description of the Structure

DuSable Park is a 3.5-acre parcel of land owned by the Chicago Park District (Park District). The Park District is in the process of developing this unused parcel of land into a public park. The land in question is located east of Lake Shore Drive in Chicago, Illinois. The Ogden Slip and the Main Branch of the Chicago River provide the northern, eastern, and southern borders of the park. Refer to Figure 1 in Appendix A for a Location Map. The portion of the park adjacent to the waterway consists of 1125 linear feet of dockwall. Refer to Photographs 1 through 3 in Appendix B for overall views of the DuSable Park dockwall.

1.3 Method of Investigation

A detailed field inspection was conducted to determine the physical condition of the steel sheeting from the waterline to the channel bottom. A brief visual examination of the dockwall above the waterline was also made.

A four-person team, consisting of a licensed structural engineer-diver, two engineer-divers, and a technician-diver conducted the underwater inspection. During the inspection, the divers were able to work from a boat, where an engineer recorded the inspection notes. Scuba equipment was used to perform the underwater inspection, consisting of a visual and tactile examination of the entire surface of the dockwall from waterline to channel bottom, with particular attention given to any noted areas of excessive deterioration or apparent distress. Photographs were taken to document typical conditions and any deterioration. Several areas on the underwater surfaces of the dockwall were cleaned so that the condition could be more closely examined. Observations of the channel bottom adjacent to the dockwall were also made. The type of channel bottom material, presence and location of scour holes, presence or absence of riprap, and the presence of debris was noted.

The location of the waterline with respect to the dockwall was noted and water depth soundings were taken with a Fathometer along the dockwall perimeter. A sounding plan was developed using these soundings. Refer to Figure 2 in Appendix A for the sounding plan along the dockwall.

2.0 EXISTING CONDITIONS

At the time of the inspection, the waterline of the Main Branch of the Chicago River was located approximately 7.0 feet below the top of the dockwall at Station 2+00. This corresponds to a waterline elevation of -2.07 feet Chicago City Datum (CCD), based on USGS data taken at Columbus Drive. Refer to Figure 2 in Appendix A for the dockwall configuration and sounding plan.

Around the perimeter of the dockwall, the channel bottom material typically consisted of silty sand and random interspersed construction debris, with up to 1.5 feet of probe rod penetration. Refer to Figures 3 and 4 in Appendix A for the Dockwall Plan and Inspection Notes.

Station 0+00 to 0+60

The dockwall in this area consisted of timber Wakefield sheeting with a concrete cap. Timber piles, measuring approximately 12 inches in diameter, were located approximately 1 foot in front of the timber sheeting. The outer layer of timber sheeting was in satisfactory condition with 1/8-inch awl penetrations and random 2-inch wide gaps between sheets. Interior timber piles filled in the gaps at all observed locations. Above water, the concrete cap was typically in fair condition with heavy concrete scale along the bottom corner, having up to 4 inches of penetration. This scale extended 18 inches along the vertical cap face and 12 inches along the cap underside. Random reinforcement was observed in this area, having up to 15 percent loss of section. The protective timber fender was in satisfactory condition with light weathering and random 1/2-inch wide checking. Below water, there was a 1-inch thick layer of marine and aquatic growth extending from the waterline to the channel bottom. Refer to Photographs 4 and 5 in Appendix B for views of the dockwall in this area.

Station 0+60 to 0+70

The dockwall in this area consisted of steel sheeting, with a concrete cap. Timber piles, measuring approximately 12 inches in diameter, were located in front of the steel sheeting at 2.5-foot centers. Between the sheeting and piles were timber stringers measuring 8 inches by 12 inches which acted as spacers. The stringers were located along the mudline and 4 feet above the channel bottom. Above water, the concrete cap was typically in fair condition with heavy concrete scale along the bottom corner, having up to 4 inches of penetration. This scale extended 18 inches along the vertical cap face and 12 inches along the cap underside. Random reinforcement was

observed in this area, having up to 15 percent loss of section. The protective timber fender was in satisfactory condition with light weathering and random 1/2 inch wide checking.

Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet, with up to 10 percent loss of section. In addition, there was a 1-inch thick layer of marine and aquatic growth extending from the waterline to the channel bottom.

Station 0+70 to 5+85

The dockwall in this area was constructed of steel sheeting. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8 inch deep, was located from the waterline down 2 feet with up to 10 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing. Heavy impact damage was observed from Station 2+63 to Station 2+80, extending from 1 foot below the waterline to the top of the wall. All interlocks were intact, except for one location at Station 2+67. This interlock had up to 1 inch of separation from 3 feet below the top of the sheeting to the waterline. In addition, a 1-inch thick layer of marine and aquatic growth extended from the waterline to the channel bottom. Refer to Photographs 6 through 10 in Appendix B for views of the dockwall in this area.

Above water, random minor areas having up to 100 percent loss of section were observed, typically measuring 2 inches in diameter with a maximum area of 8 inches by 8 inches. Additionally, random areas of impact damage extended along the top 6 inches of the dockwall from Station 0+70 to Station 3+25. The steel had indentations measuring up to 6 inches deep with random small areas having up to 100 percent loss of section.

Between Station 3+25 and Station 3+66, the frequency of the missing fender anchors increased creating a 3-inch diameter hole in every other outer sheet face. These holes were typically located between 2 feet and 3 feet above the waterline. The steel sheeting in this area also exhibited random burn holes, measuring 3 inches in diameter.

The interlocks along the waterline typically exhibited up to 30 percent section loss between Station 3 + 35 and Station 3 + 66. In this area, the steel sheeting exhibited moderate impact damage causing tears along the faces of the steel sheeting and up to 50 percent loss of section. Additionally, no tie rods were visible along this section of wall.

From Station 3 + 66 to Station 5 + 25, approximately 75 percent of the fender anchors were missing. Between Station 5 + 25 and Station 5 + 85, approximately 20 percent of the fender anchors were missing.

Station 5 + 85 to 7 + 75

The dockwall in this area consisted of steel sheeting. The steel plate washers located on every other outer pan face had failed or were heavily corroded in locations where the threaded anchor rod extended outward. At locations where the anchor heads were located along the exterior wall face, the washers typically exhibited light to moderate corrosion. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet with up to 10 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing. All interlocks were intact, with a 1 inch thick layer of marine and aquatic growth extending from the waterline to the channel bottom. Refer to Photograph 11 in Appendix B for a view of the dockwall in this area.

Station 7 + 75 to 9 + 25

The dockwall in this area was constructed of steel sheeting. Along this portion of the wall, heavy pack rust was observed between the plate washers and sheeting. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/16-inch deep pitting over 25 percent of the steel surface area and at the interlocks. Heavier scale and pitting, measuring up to 1/8 inch deep, was located from the waterline down 2 feet with up to 10 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing. All interlocks were intact, with a 1-inch thick layer of marine and aquatic growth extending from the waterline to the channel bottom. Refer to Photograph 12 for a view of the dockwall in this area.

Station 9 + 25 to 10 - 85

The dockwall in this area consisted of steel sheeting. Along this portion of the wall, the anchor rod nuts typically exhibited up to 25 percent section loss, with random nuts exhibiting up to 75 percent loss of section. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/16-inch deep pitting. Heavy pitting, measuring up to 1/8-inch deep, extended down 5 feet from the waterline. Above water, the sheeting typically exhibited heavy section loss from the waterline up 3 feet with 50 percent loss of section. The heaviest section loss was located at 3 feet above the waterline, where there was up to 100 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing. All interlocks were intact, with a 1-inch thick layer of marine and aquatic growth extending from the waterline to the channel bottom. Refer to Photographs 13 through 17 in Appendix B for views of the dockwall in this area.

Station 10 + 85 to 11 + 25

The dockwall in this area was constructed of steel sheeting. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet with up to 10 percent loss of section. Above water, the anchor washers typically exhibited up 10 percent section loss. All interlocks were intact, with a 1-inch thick layer of marine and aquatic growth extending from the waterline to the channel bottom. Refer to Photograph 18 for a view of the dockwall in this area.

3.0 EXCAVATION FINDINGS

Two areas of the retained soil adjacent to the dockwall were excavated on July 19, 2005. Excavations were performed at Station 3 + 94 and Station 9 + 50 to determine the condition and configuration of the sheeting anchorage system.

Station 3 + 94

The dockwall anchorage system in this area typically consisted of a 1-1/2 inch diameter steel rod located 5.5 feet below the top of the sheeting. A 3 foot long section of the rod was heavily

corroded adjacent to the steel sheeting, with up to 75 percent loss of section. Further excavation of this area revealed that the rod extended approximately 35 feet from the dockwall. The western end of the rod was free, with no anchorage system observed. In addition, the interior face of the sheet pile wall was heavily corroded, with up to 20 percent loss of section. Refer to Figure 5 in Appendix A for a section view of the dockwall at Station 3+94. Refer to Photographs 19 through 21 in Appendix B for views of the excavation area.

While excavating this area, the northern end of the dockwall anchorage system was observed from Station 3+35 to Station 3+60. The anchorage system consisted of 1-1/2 inch diameter steel rods extending approximately 28 feet from the dockwall. The rods were anchored to timber railroad ties, measuring 12 inches by 12 inches. No additional wall anchorage components, such as sheeting or soldier piles, were observed. It should be noted that no ties extended through the dockwall in this area.

Station 9+50

The dockwall anchorage system in this area typically consisted of a 1-1/2 inch diameter steel rod located approximately 7 feet below the top of the sheeting. Light corrosion of the anchor was evident, with less than 10 percent loss of section. The rod extended approximately 3 feet behind the steel sheeting, where it was attached to two channels. However, no additional wall anchorage components were observed in this area. In addition, moderate oxidation of the interior face of the sheet pile wall was observed, having less than 10 percent loss of section. Refer to Figure 6 in Appendix A for a section view of the dockwall at Station 9+50. Refer to Photographs 22 and 23 in Appendix B for views of the excavation area.

4.0 EVALUATION AND RECOMMENDATIONS

Overall, the DuSable Park dockwall was generally in poor condition. The deterioration and damage to the steel sheet piling coupled with the lack of a structurally adequate anchorage system make the possibility of repairs cost prohibitive. Currently, portions of the steel sheet pile dockwall are acting as cantilevers, greatly reducing the structural integrity of the wall system.

Based on the underwater inspection findings and the excavation observations, it is recommended that the existing steel sheet pile dockwall be removed and replaced with a properly designed earth retention system. Refer to Figure 7 in Appendix A for a section view of a commonly

used dockwall configuration. Regardless of how the replacement dockwall system is configured, the structure should be designed and sealed by a Licensed Structural Engineer in the state of Illinois.

Preliminary estimates indicate that the cost to remove the existing wall and replace it with a structurally adequate system, as depicted in Figure 7 of Appendix A, will be approximately $5,710,000. This estimate includes the cost of removing the existing steel sheeting, furnishing and erecting new steel sheeting with a structural anchorage system, and installing new protective timber fenders. Refer to the spreadsheet located on the next page for a detailed cost estimate to remove and replace the existing dockwall.

Collins appreciates this opportunity to be of service to Kudrna with regard to this dockwall assessment. Please note that we have considerable experience in all phases of the design and management of new dockwall construction, and would like to assist you in that regard, if and when the need arises. If you have any questions regarding this report, please contact me at 312.704.9300.

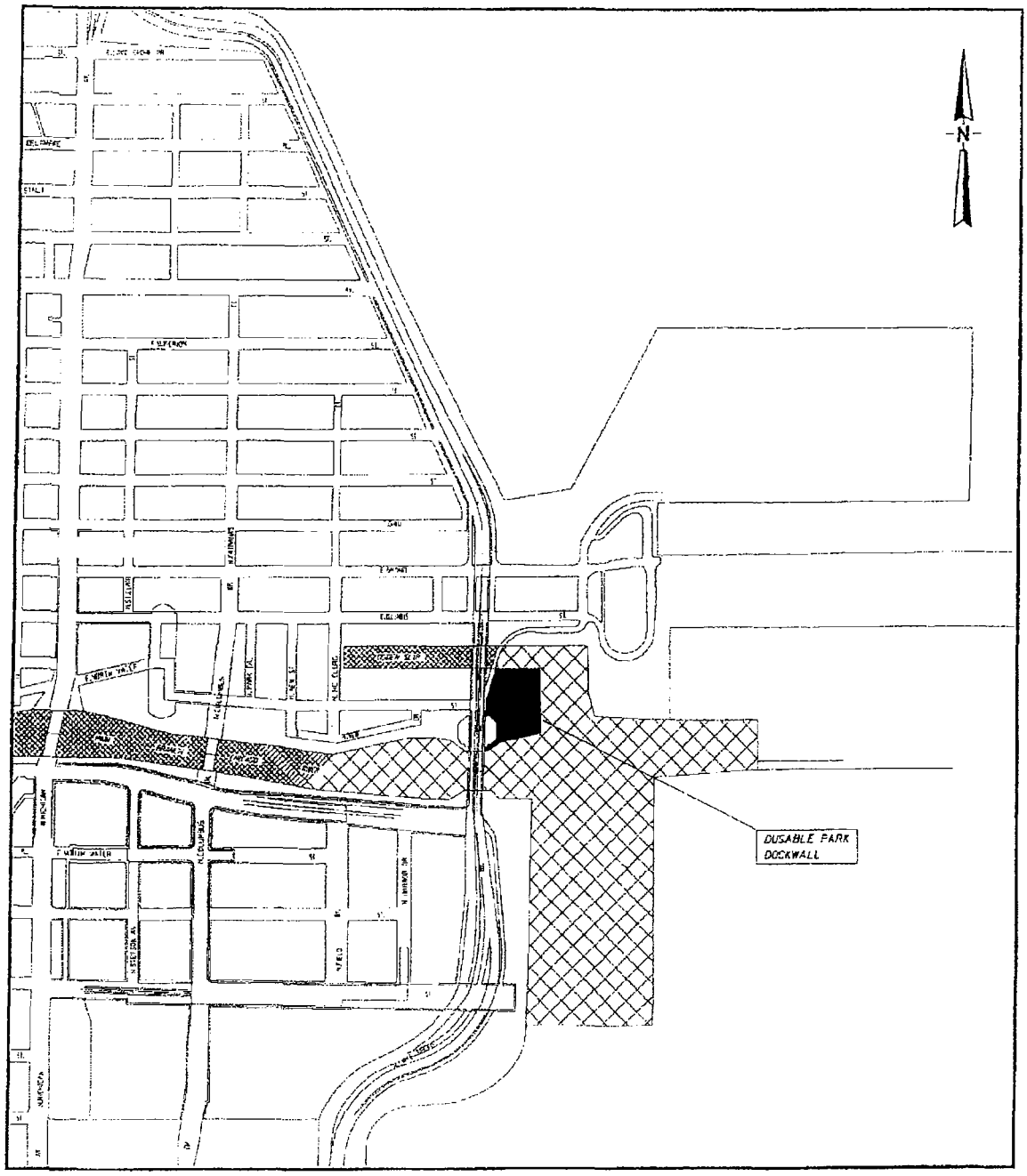
080405
Exp. 11-30-06

Respectfully submitted,

COLLINS ENGINEERS, INC.

John E. O'Leary, P.E., S.E.

DuSable Park Dockwall						
Item No.	Category	Pay Item Description	Unit	Quantity	Unit Price	Total
1	S	REMOVAL OF EXISTING SHEETING	L SUM	1	$400,000	$400,000
2	S	FURNISHING AND ERECTING STRUCTURAL STEEL	L SUM	1	$1,592,340	$1,592,340
3	S	FURNISHING STEEL PILES HP14X73	LIN FT	21400	$48	$1,027,200
4	S	STEEL SHEET PILING	SQ FT	69700	$38	$2,648,600
5	S	TIMBER FENDER SYSTEM	LIN FT	1125	$35	$39,375
					TOTAL	**$5,707,515**



PARK #478
DUSABLE PARK

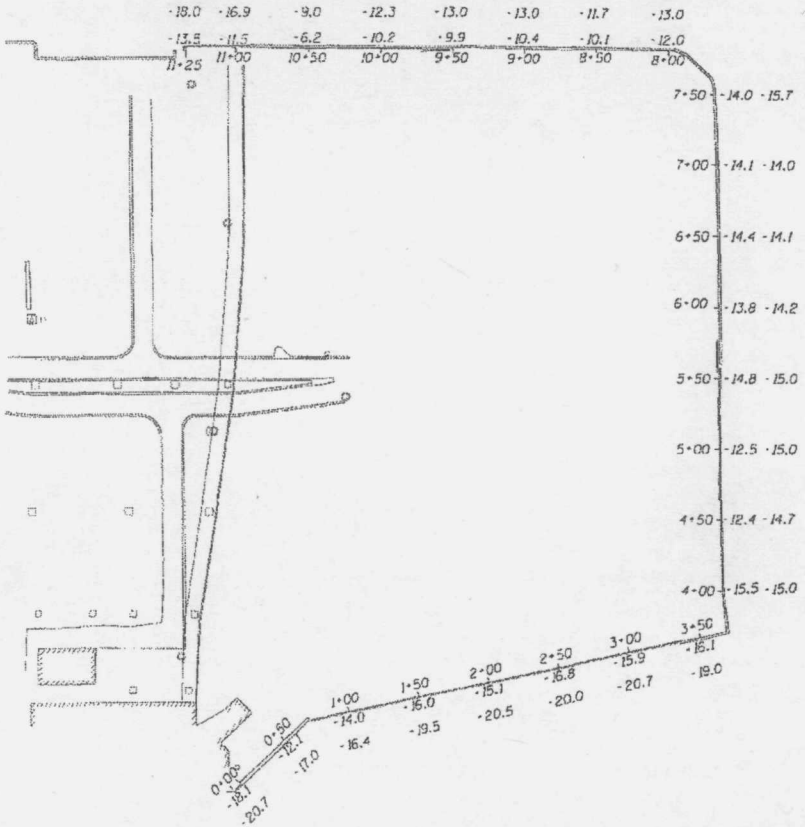
DUSABLE PARK DOCKWALL

LOCATION MAP

Drawn By: ER	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-5360 www.collinseng.com CLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184.006992	Date: AUGUST, 2005
Checked By: JEG		Scale: NONE
Code: 4372D001		Figure No.: 1

Appendix A

Figures



General Notes:

1. Approximately 1125 linear feet of the DuSable Park dockwall was inspected under water.
2. At the time of the inspection on April 7, 2005 the waterline was located approximately 7.0 feet below the top of the dockwall at Station 2+00. This corresponds to a waterline elevation of -2.07 feet Chicago City Datum (CCD), based on USGS data taken at Columbus Drive.
3. Soundings indicate the channel bottom depths at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the dockwall, as well as 20 feet from the dockwall.

LEGEND:

-14.0 Channel Bottom Depth

PARK #478
DUSABLE PARK

DUSABLE PARK DOCKWALL

SOUNDING PLAN

Drawn By: DR	COLLINS ENGINEERS	Date: AUGUST, 2005
Checked By: JCC		Scale: 1"=80'
Code: 43720001		Figure No.: 2

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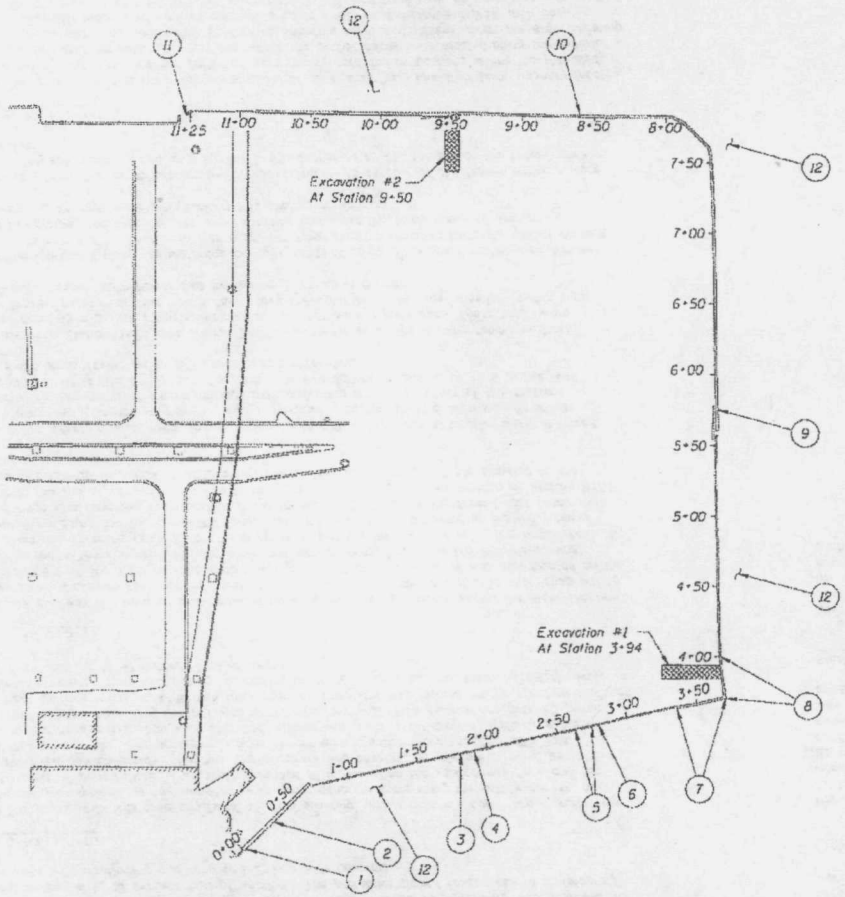

Inspection Notes:

(1) Concrete section loss along east side of expansion joint from the waterline up 2 feet. Area measured 1 foot in width with up to 18 inches of penetration and exposed steel reinforcement having up to 15 percent loss of section.

(2) Concrete section loss along construction joint from the waterline up 2 feet. Area measured 2 feet in width with up to 8 inches of penetration.

(3) Area of 100 percent steel section loss measuring 16 inches in height and 8 inches in width at 2 feet above the waterline.

(4) Heavy impact damage extending downward 6.5 feet from the top of the steel sheeting, with an indentation measuring up to 1 foot deep and a 1 foot long tear in the sheeting.

(5) Heavy impact damage from 1 foot below the waterline to the top of the steel sheeting, with 1 foot deep indentations. The interlock at Station 2+67 had opened up to 1 inch wide from the waterline to 3 feet below the top of the steel sheeting. Vertical tears in the sheeting extended from 1 foot above the waterline to 4 feet below the waterline, with a 1 foot square area of 100 percent section loss at the waterline.

(6) Heavy impact damage from the top of the steel sheeting to 1 foot above the waterline. The steel sheeting exhibited 100 percent section loss in this area, with a visible loss of backfill material creating a 3-foot deep sinkhole behind the wall.

(7) No tie rods visible between Station 3+35 and Station 3+66.

(8) Heavy impact damage to steel channel whaler at 1.5 feet above the waterline from Station 3+56 to Station 4+00.

(9) Area of 100 percent steel section loss measuring 2.5 feet high and 2 inches wide, located 3 feet above the waterline.

(10) Outfall with hole in sheeting measuring 2 feet high by 3 feet wide at 4 feet above the waterline.

(11) Gap between steel sheeting and concrete dockwall, measuring up to 3 inches wide above the waterline and 18 inches wide below the waterline.

(12) The Channel bottom material typically consisted of silty sand and random interspersed construction debris, with up to 1.5 feet of probe rod penetration.

General Notes:

1. Refer to Figure 4 for General Dockwall Inspection Notes.
2. At the time of the inspection on April 7, 2005 the waterline was located approximately 7.0 feet below the top of the dockwall at Station 2+00. This corresponds to a waterline elevation of -2.07 feet Chicago City Datum (CCD), based on the USGS data taken at Columbus Drive..
3. Soundings indicate the channel bottom depths at the time of inspection and are measured in feet.

PARK #478
DUSABLE PARK

DUSABLE PARK DOCKWALL

PLAN AND INSPECTION NOTES

Drawn By: BH	COLLINS ENGINEERS	Date: AUGUST, 2005
Checked By: JED		Scale: 1"=80'
Code: 43720001		Figure No.: 3

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General Dockwall Inspection Notes:

Station 0+00 to 0+60

• The dockwall in this area consisted of timber Wakefield sheeting with a concrete cap. The outer layer of timber sheeting was in satisfactory condition with 1/8-inch awl penetrations and random 2-inch wide gaps between sheets. Interior timber piles filled in the gaps at all observed locations. Above water, the concrete cap was typically in fair condition with heavy concrete scale along the bottom corner, having up to 4 inches of penetration. This scale extended 18 inches along the vertical cap face and 12 inches along the cap underside. Random reinforcement was observed in this area, having up to 15 percent loss of section. The protective timber fender was in satisfactory condition with light weathering and random 1/2-inch wide checking.

Station 0+60 to 0+70

• The dockwall in this area consisted of steel sheeting, with a concrete cap. Above water, the concrete cap was typically in fair condition with heavy concrete scale along the bottom corner, having up to 4 inches of penetration. This scale extended 18 inches along the vertical cap face and 12 inches along the cap underside. Random reinforcement was observed in this area, having up to 15 percent loss of section. The protective timber fender was in satisfactory condition with light weathering and random 1/2-inch wide checking. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet, with up to 10 percent loss of section.

Station 0+70 to 5+85

• The dockwall in this area was constructed of steel sheeting. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet, with up to 10 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing. Heavy impact damage was observed from Station 3+63 to Station 2+80, extending from 1 foot below the waterline to the top of the wall. All interlocks were intact, except for one location at Station 2+67. This interlock had up to 1 inch of separation from 3 feet below the top of the sheeting to the waterline.

• Above water, random minor areas having up to 100 percent loss of section were observed, typically measuring 2 inches in diameter with a maximum area measuring 8 inches by 8 inches. Additionally, random areas of impact damage extended along the top 6 inches of the dockwall from Station 0+70 to Station 3+25. The steel had indentations measuring up to 6 inches with random small areas having up to 100 percent loss of section.

• Between Station 3+25 and Station 3+66, the frequency of the missing fender anchors increased creating a 4-inch diameter hole in every other outer sheet face. These holes were typically located between 2 feet and 3 feet above the waterline. The steel sheeting in this area also exhibited random burn holes, also measuring 3 inches in diameter.

• The interlocks along the waterline typically exhibited up to 30 percent section loss between Station 3+35 and Station 3+66. In this area, the steel sheeting exhibited moderate impact damage causing tears along the faces of the steel sheeting and up to 50 percent loss of section. Additionally, no tie rods were visible along this section of wall.

• From Station 3+66 to Station 5+25, approximately 75 percent of the fender anchors were missing. Between Station 5+25 and Station 5+85, approximately 20 percent of the fender anchors were missing.

Station 5+85 to 7+75

• The dockwall in this area was constructed of steel sheeting. The steel plate washers located on every other outer pan face had failed or were heavily corroded in locations where the threaded anchor rod extended outward. At locations where the anchor heads were located along the exterior wall face, the washers typically exhibited light to moderate corrosion. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet, with up to 10 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing.

Station 7+75 to 9+25

• The dockwall in this area was constructed of steel sheeting. Along this portion of the wall, heavy pack rust was observed between the plate washers and sheeting. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/16-inch deep pitting over 25 percent of the steel surface area and at the interlocks. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet, with up to 10 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing.

Station 9+25 to 10+85

• The dockwall in this area was constructed of steel sheeting. Along this portion of the wall, the anchor rod nuts typically exhibited up to 25 percent section loss, with random nuts exhibiting up to 75 percent loss of section. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/16-inch deep pitting. Heavy pitting, measuring up to 1/8-inch deep, extended down 5 feet from the waterline. Above water, the sheeting typically exhibited heavy section loss from the waterline up 3 feet with 50 percent loss of section. The heaviest section loss was located at 3 feet above the waterline, where there was up to 100 percent loss of section. The timber fenders were typically missing and the remaining fender anchors were either deformed or missing.

Station 10+85 to 11+25

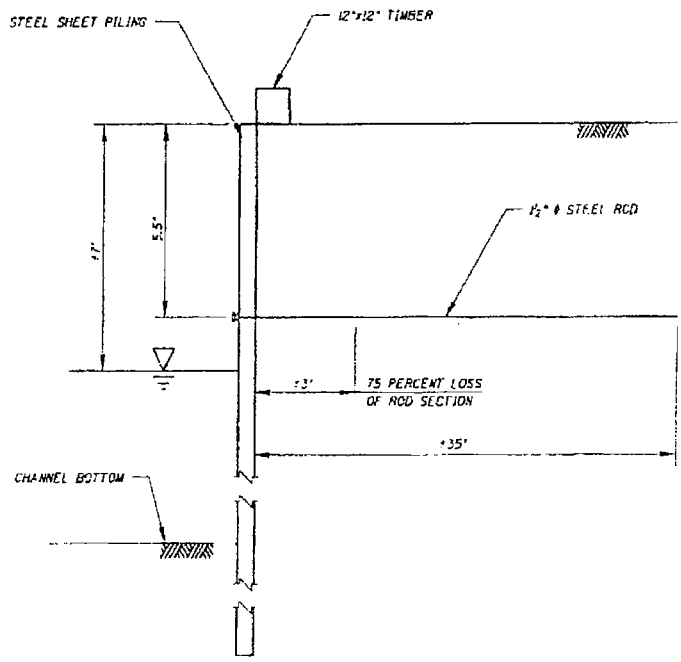
• The dockwall in this area was constructed of steel sheeting. Below water, the steel sheeting typically exhibited random rust nodules measuring up to 1 inch in diameter and 1/32-inch deep pitting over 25 percent of the steel surface area. A 1/16-inch thick layer of scale was also located on the sheeting surfaces below water. Heavier scale and pitting, measuring up to 1/8-inch deep, was located from the waterline down 2 feet, with up to 10 percent loss of section. Above water, the anchor washers typically exhibited up to 10 percent section loss.

PARK #478
DUSABLE PARK

DUSABLE PARK DOCKWALL

GENERAL DOCKWALL
INSPECTION NOTES

Drawn By: DH	COLLINS ENGINEERS	Date: AUGUST 2020
Checked By: JEO		Scale: NTS
Code: 43720001		Figure No.: 4



DOCKWALL SECTION AT STATION 3+94

PARK #478
DUSABLE PARK

DUSABLE PARK DOCKWALL

EXISTING DOCKWALL SECTION
AT STATION 3+94

Drawn By: DR	COLLINS ENGINEERS	Date: AUGUST, 2005
Checked By: JFO	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-5260	Scale: NONE
Code: 4.5720CC1	ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-005952	Figure No.: 5

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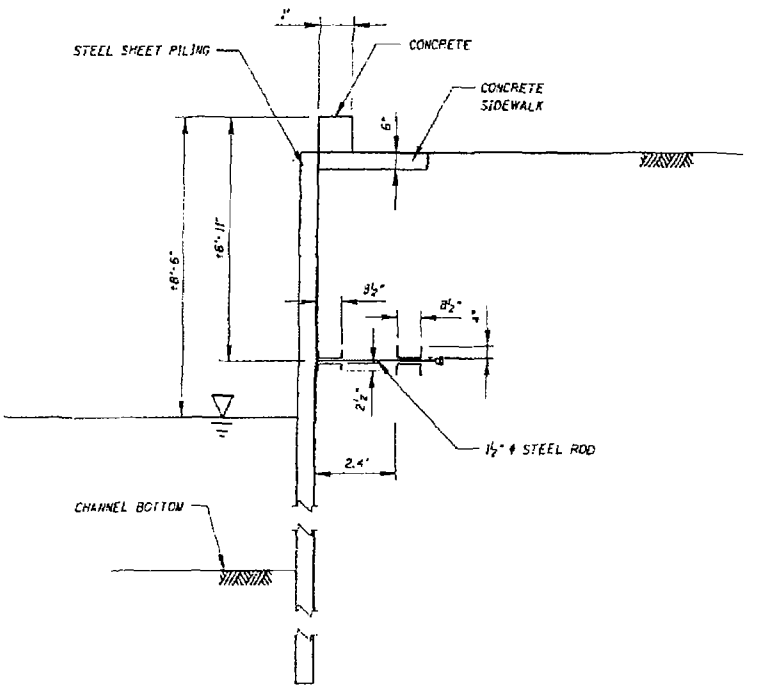

DOCKWALL SECTION AT STATION 9+50

PARK #478
DUSABLE PARK

DUSABLE PARK DOCKWALL

EXISTING DOCKWALL SECTION AT STATION 9+50

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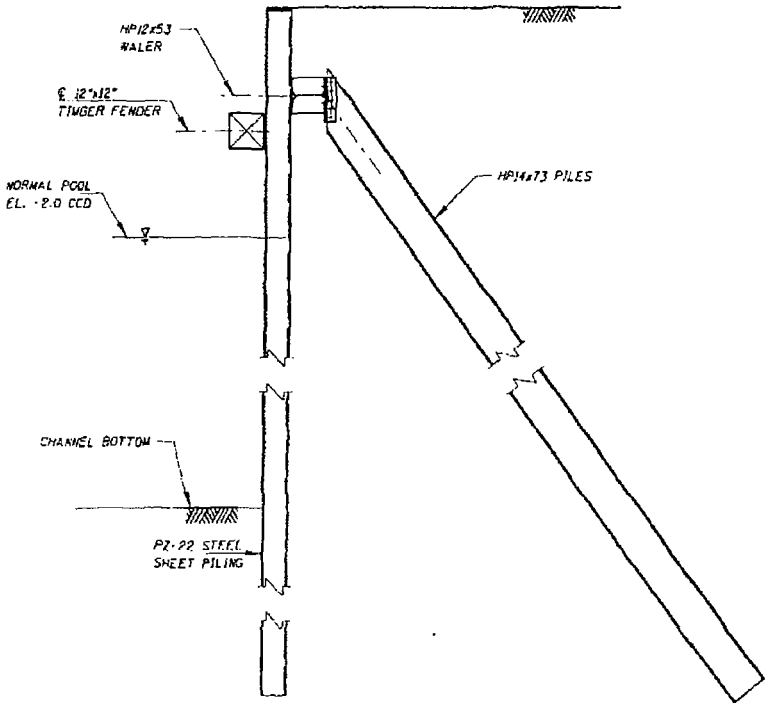
Checked By: JED		Scale: NONE
Code: 4372G001		Figure No.: 6



REPLACEMENT DOCKWALL SECTION

PARK #478
DUSABLE PARK

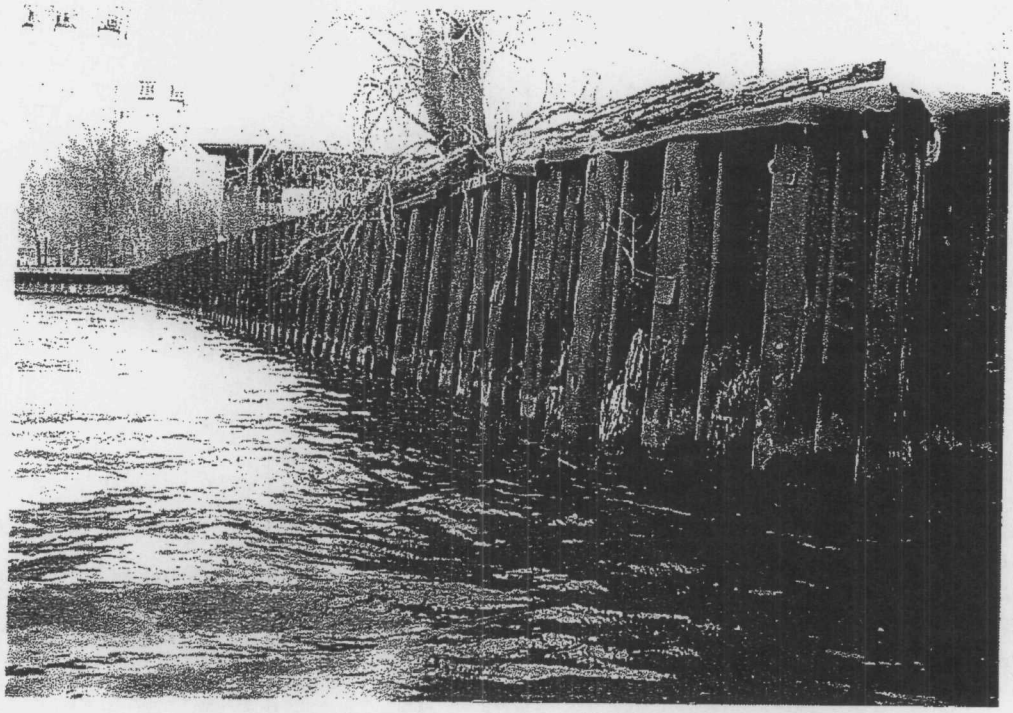
DUSABLE PARK DOCKWALL

REPLACEMENT DOCKWALL SECTION

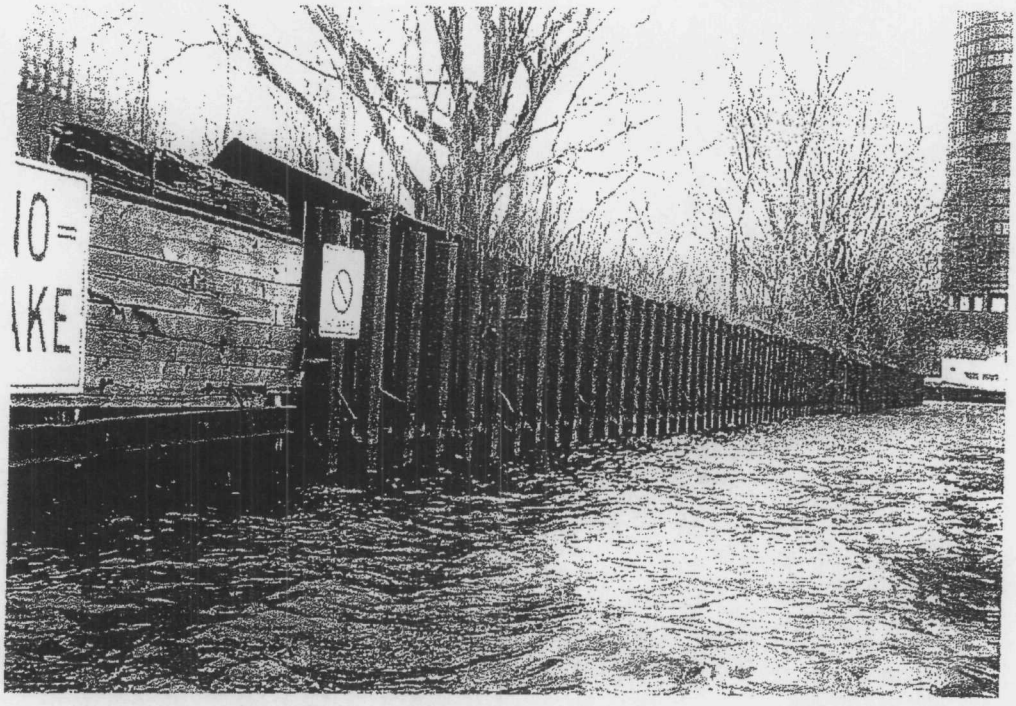
Drawn By: DK	COLLINS ENGINEERS, P.C. 123 North Wacker Drive Suite 306 Chicago, IL 60606 (312) 704-5360 www.collinsengr.com ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-006818	Date: AUGUST, 2005
Checked By: ICO		Scale
Code: 4372B001		Figure No.: 7

Appendix B

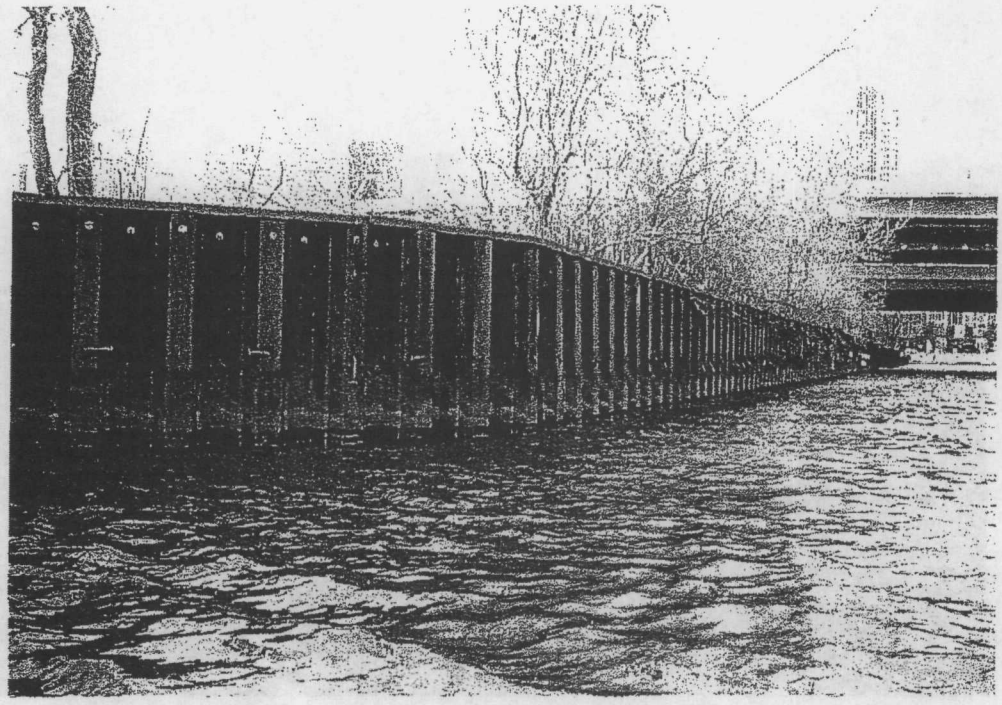
Photographs



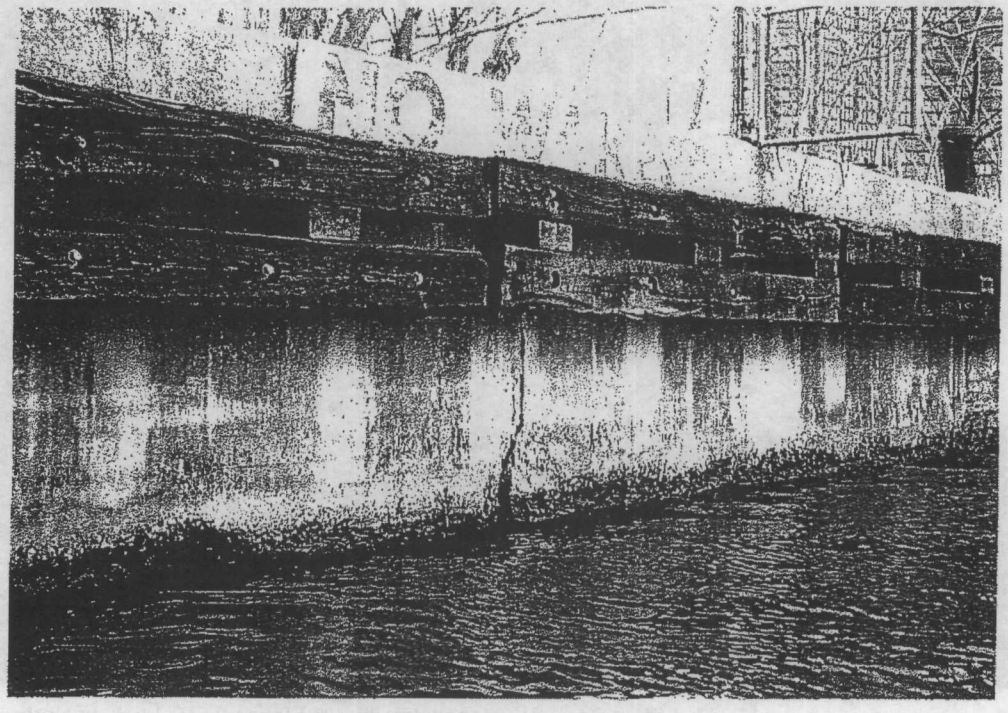
Photograph 1. Overall View of South Dockwall Face, Looking Northwest from Station 3+66.



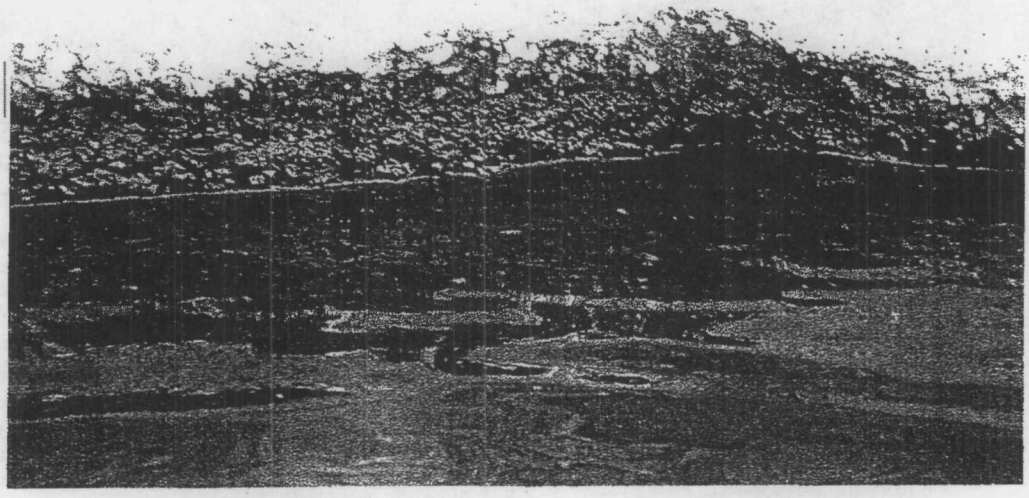
Photograph 2. Overall View of East Dockwall Face, Looking Northwest from Station 3+66.



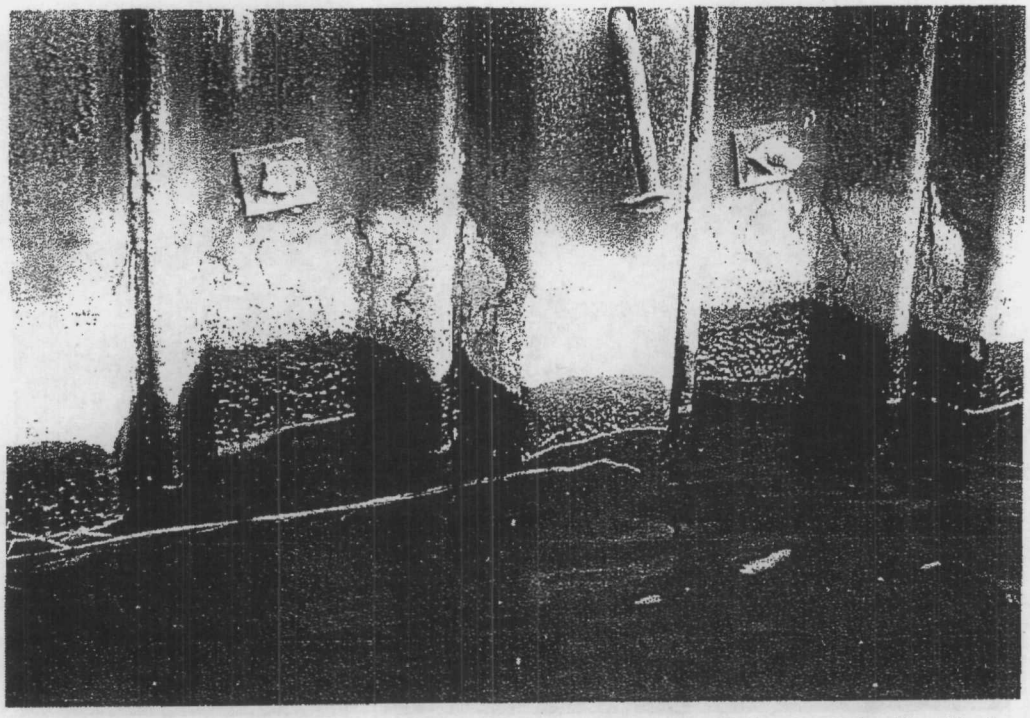
Photograph 3. Overall View of North Dockwall Face, Looking Southwest from Station 7+77.



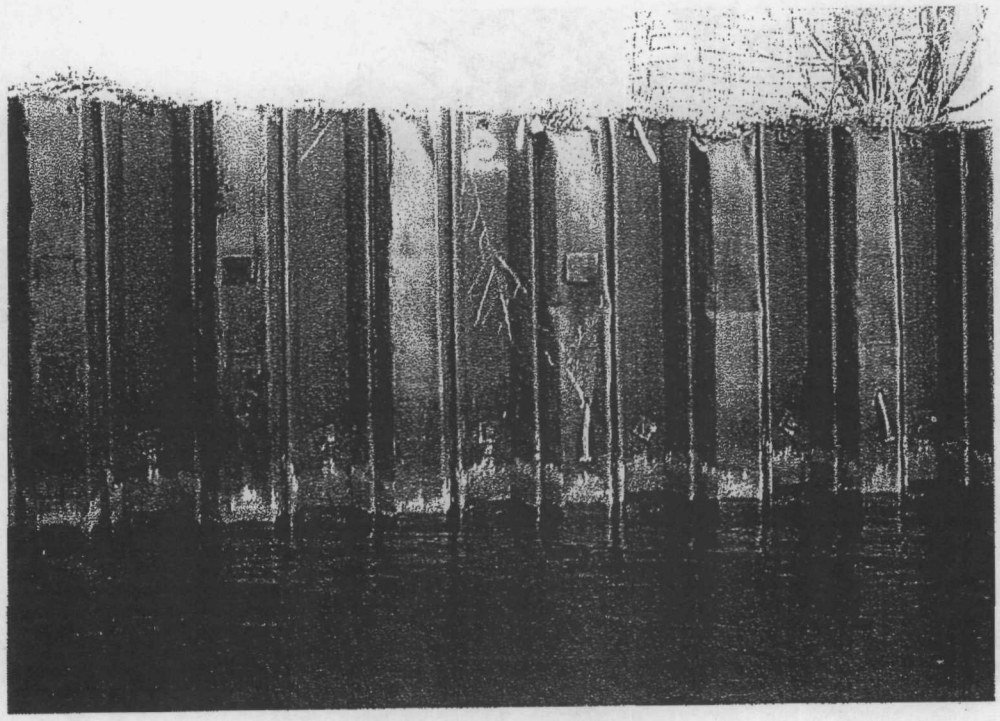
Photograph 4. Dockwall at Station 0+30, Looking Northeast.



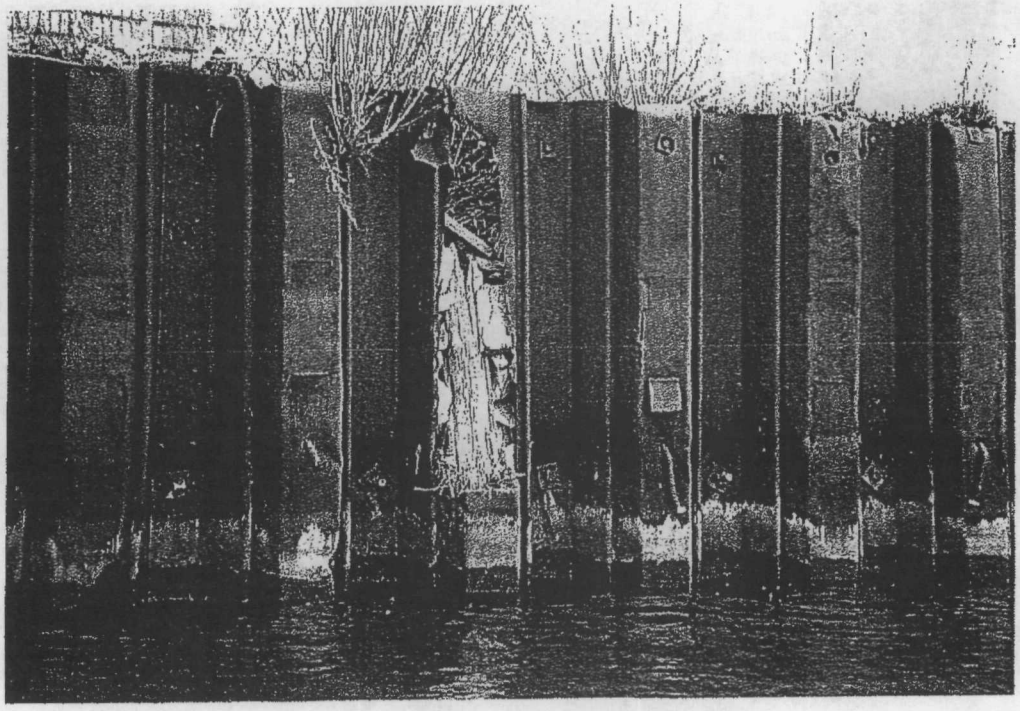
Photograph 5. View of Typical Concrete Cap Condition along Waterline at Station 0+20, Looking North.



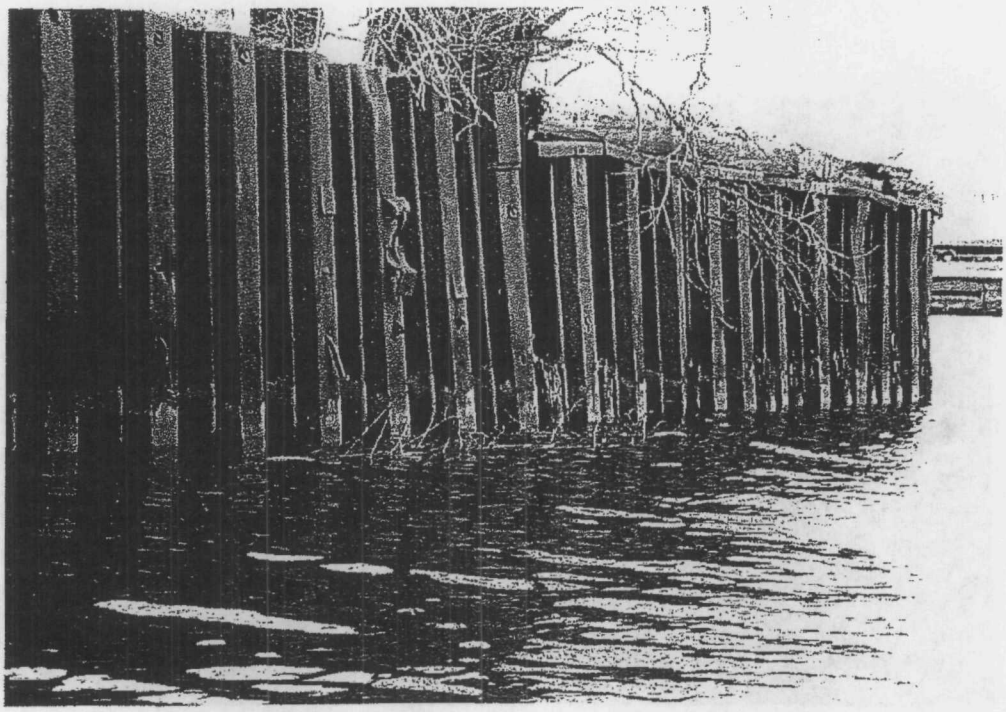
Photograph 6. View of Typical Steel Condition along Waterline at Station 0+75, Looking North.



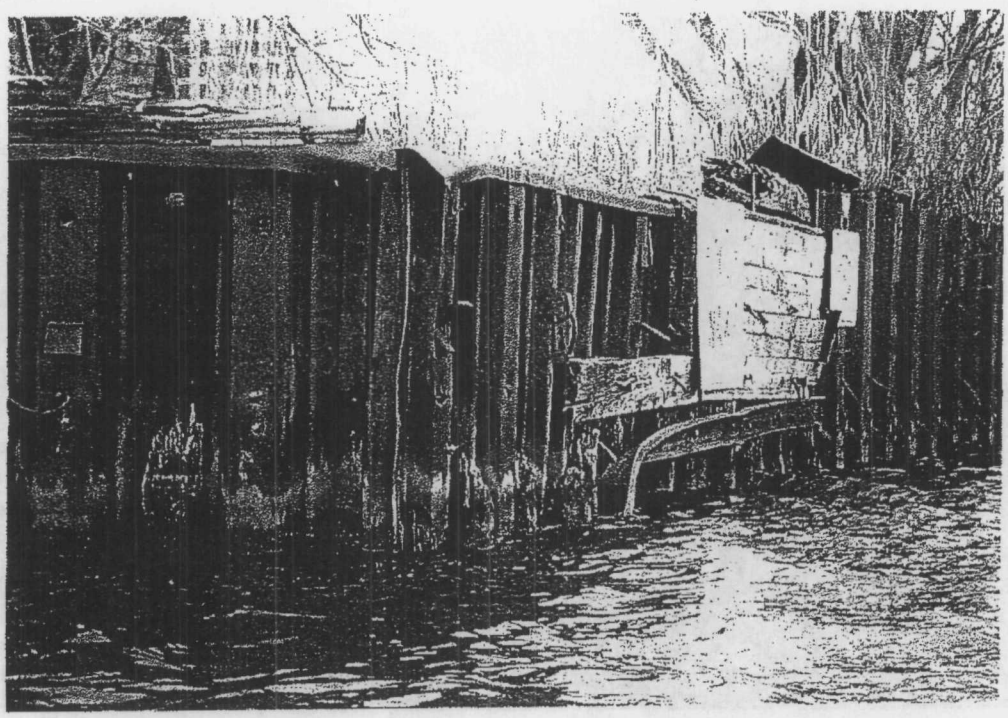
Photograph 7. View of Dockwall at Station 2+00, Looking North.



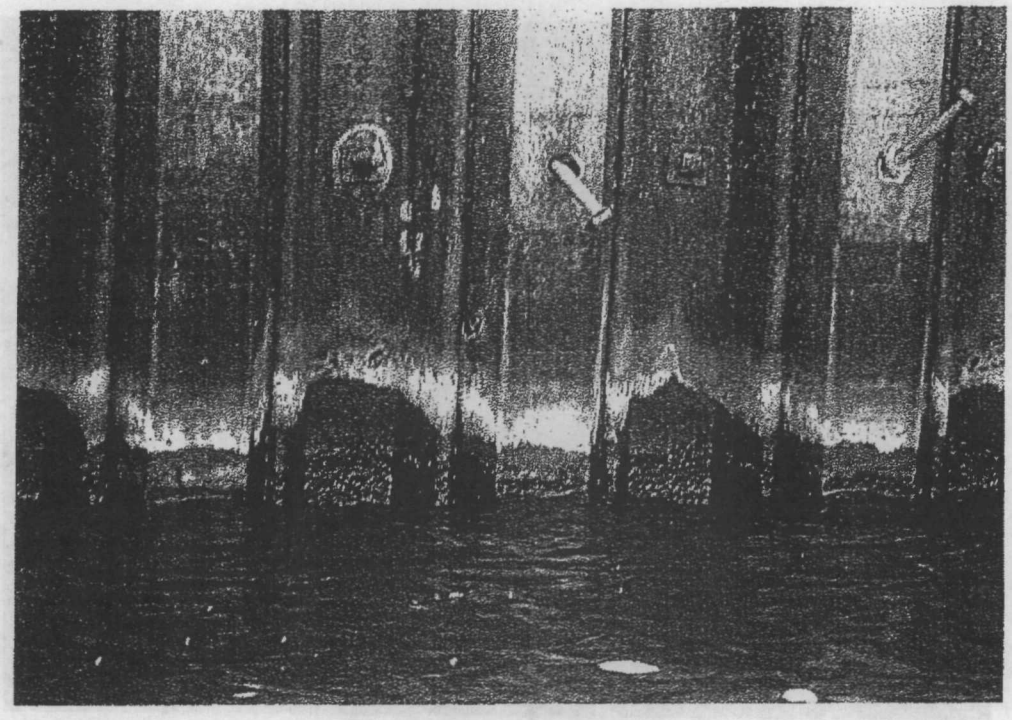
Photograph 8. View of Failed Sheet at Station 2+80, Looking North.



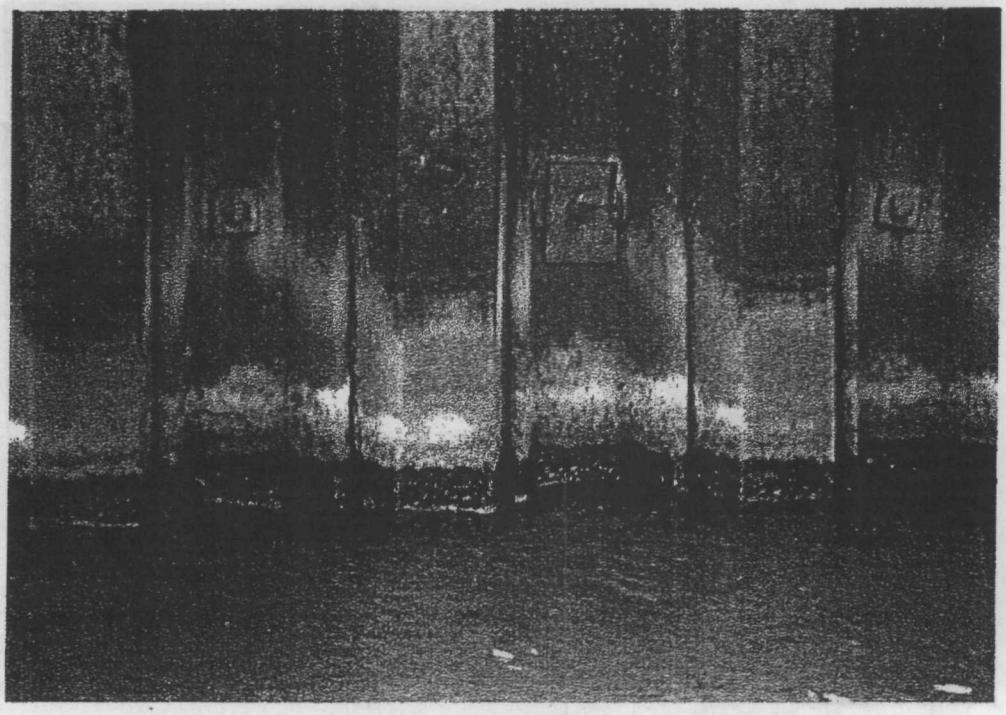
Photograph 9. View of Typical Dockwall Configuration, Looking Northeast from Station 3+00.



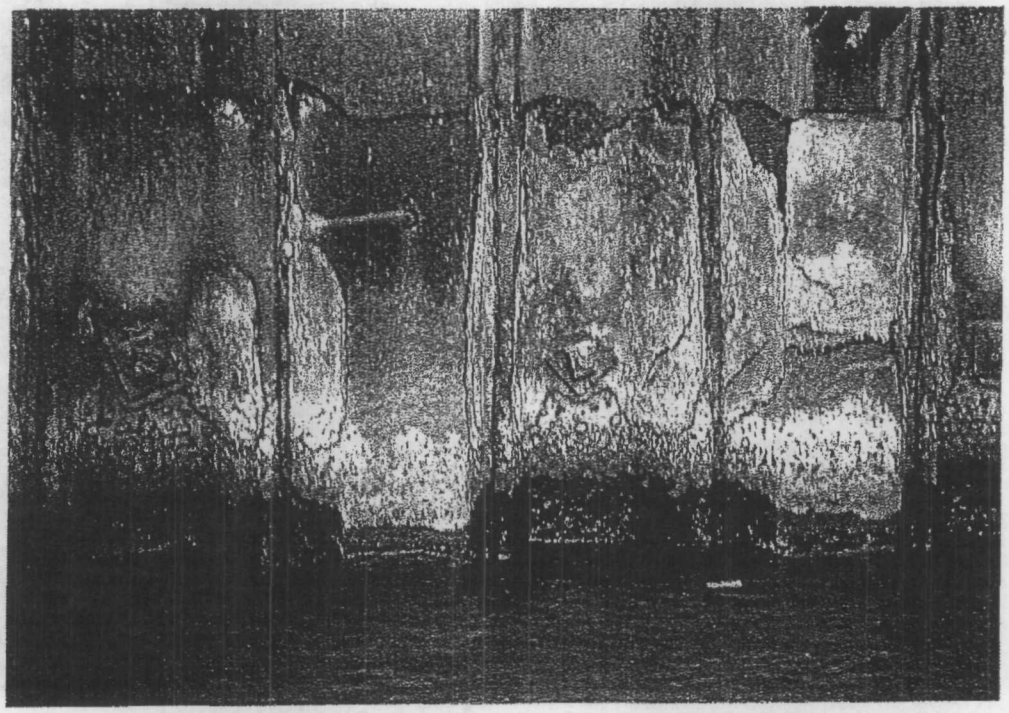
Photograph 10. View of Typical Steel Condition, Looking Northwest from Station 3+66.



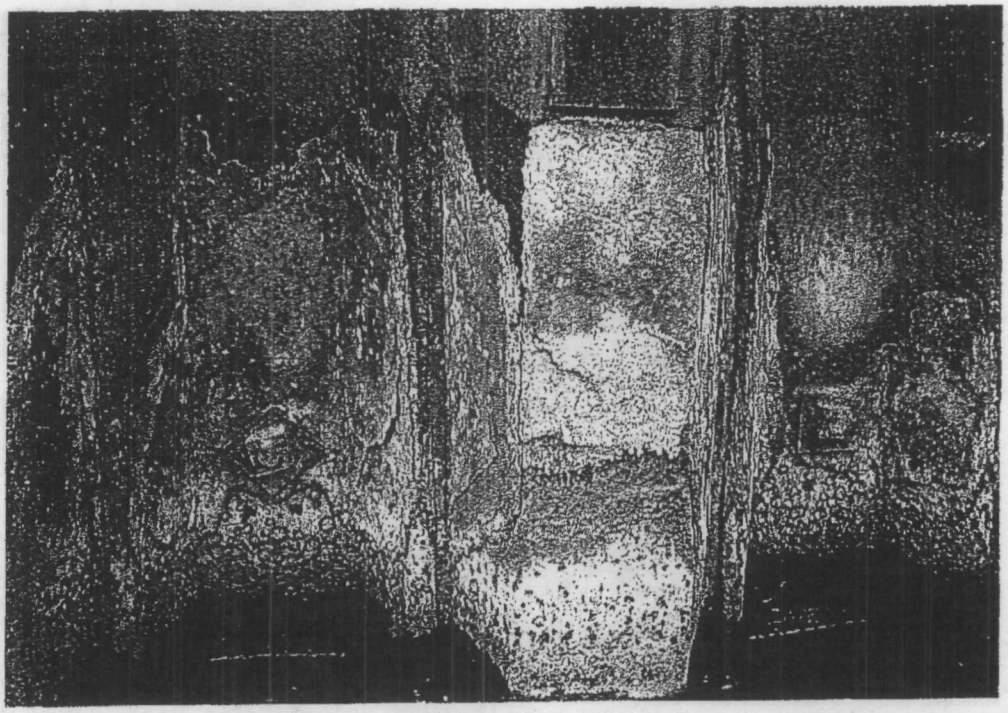
Photograph 11. View of Typical Steel Condition at Station 7+00, Looking West.



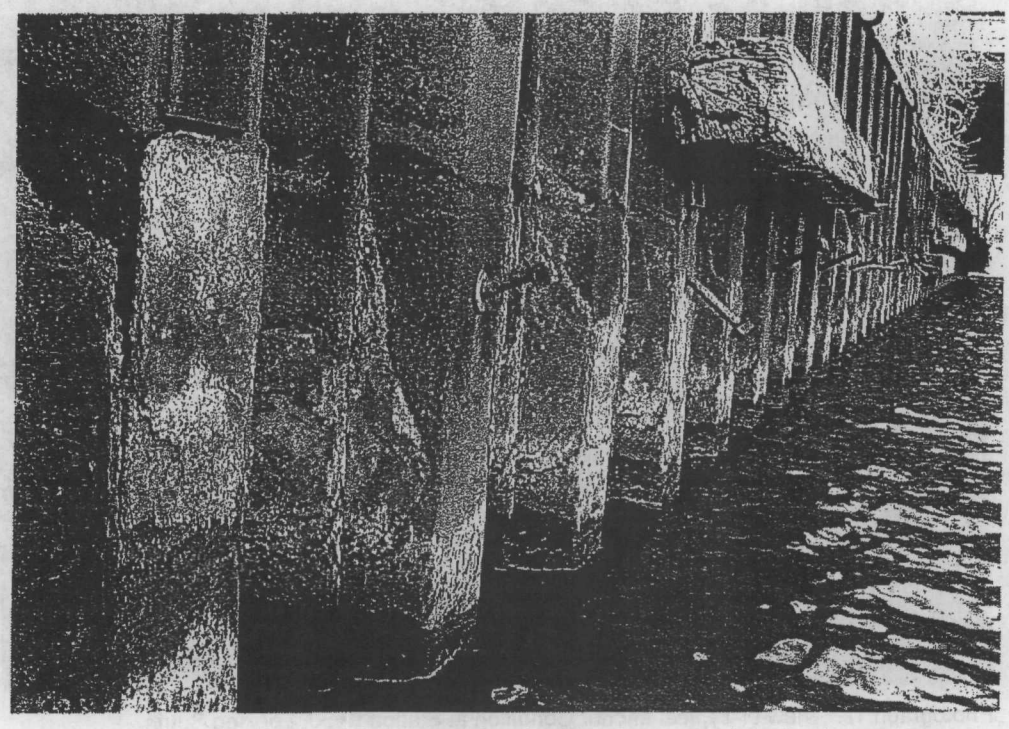
Photograph 12. View of Typical Steel Condition at Station 8+00, Looking West.



Photograph 13. View of Typical Steel Condition at Station 9+40, Looking South. Note Heavy Layer of Pack Rust and Steel Section Loss from the Waterline up 2 Feet.



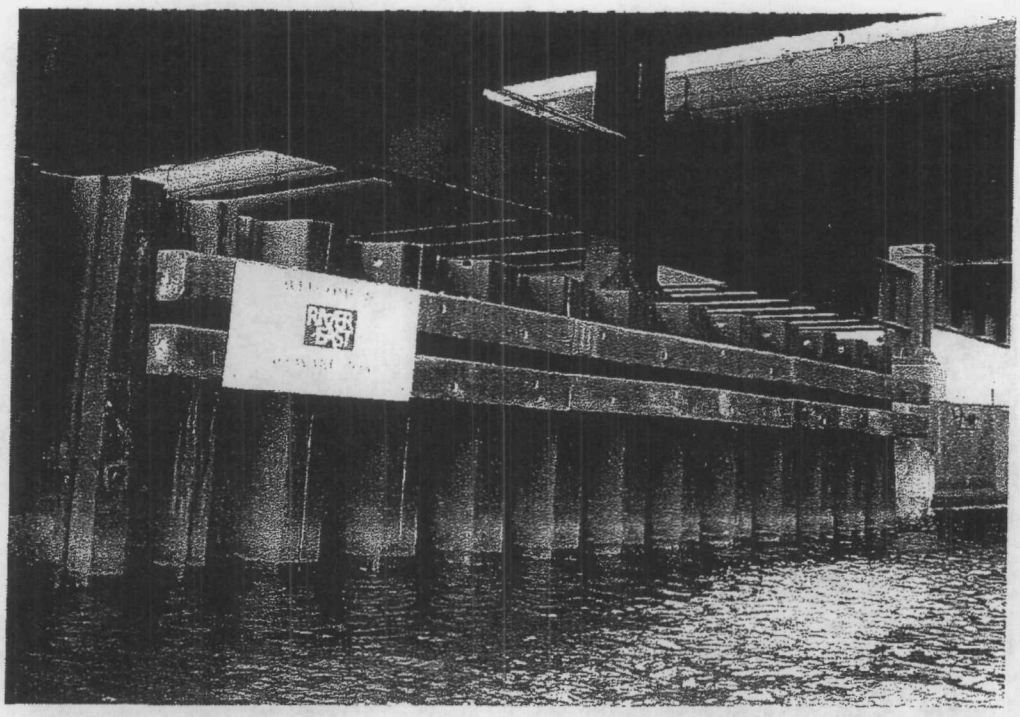
Photograph 14. View of Typical Steel Condition at Station 9+40, Looking South. Note Heavy Layer of Pack Rust and Steel Section Loss from the Waterline up 2 Feet.



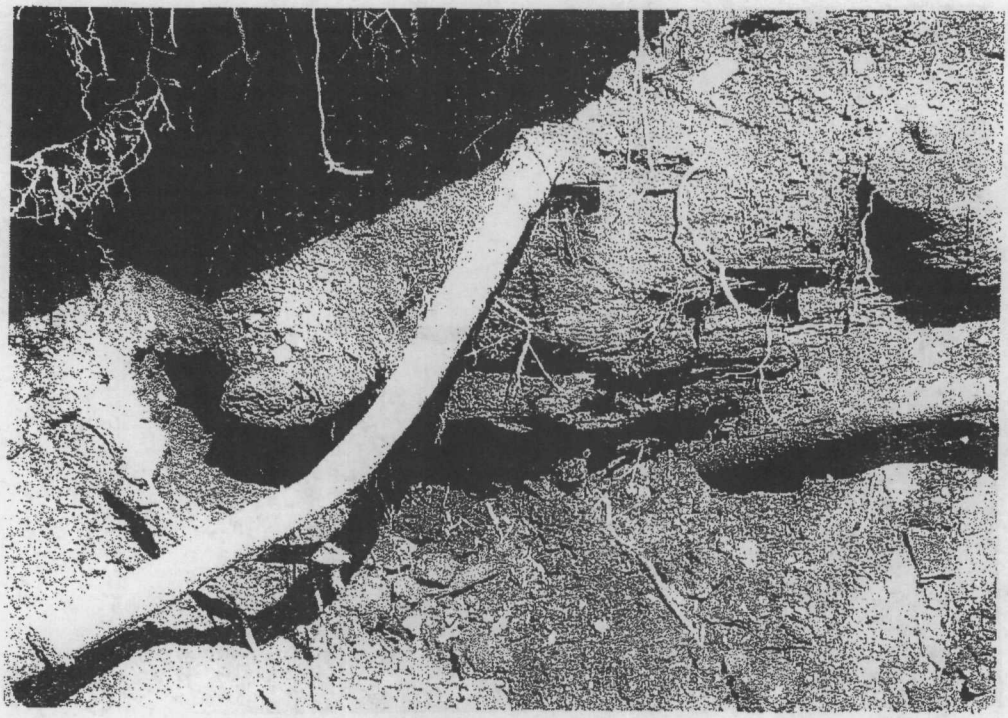
Photograph 15. View of Typical Steel Condition, Looking Southwest from Station 9+40.

Photograph 16. View of Typical Steel Condition, Looking Southwest from Station 9+40. Note Heavy Steel Section Loss 2 Feet Above the Waterline.

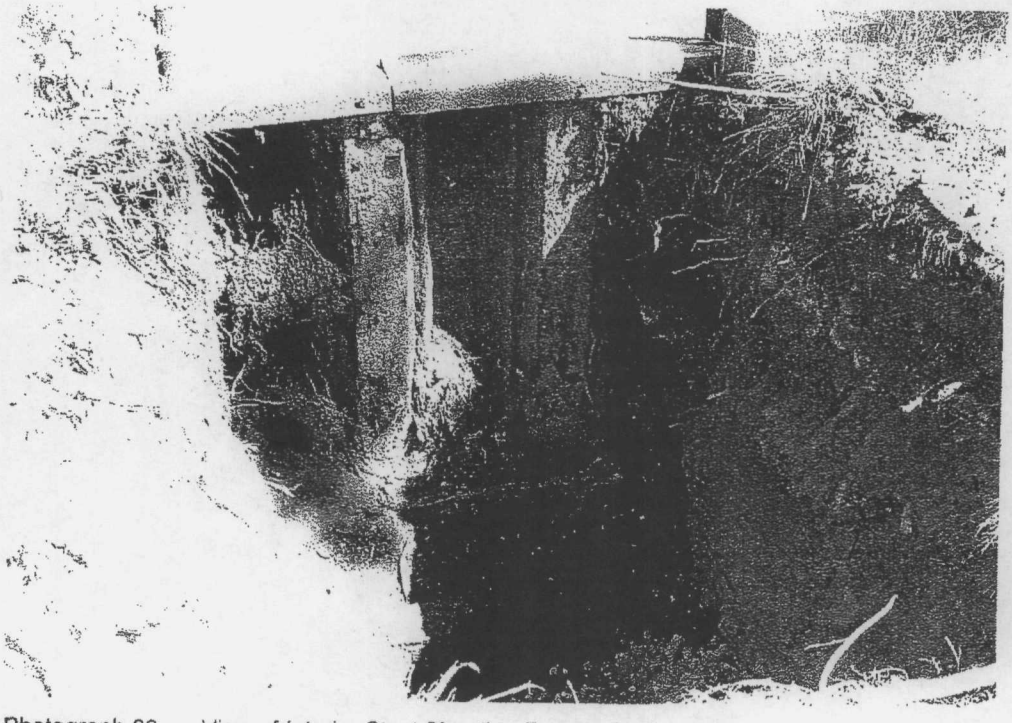
Photograph 17. View of Typical anchor Condition at Station 9+80, Looking South.



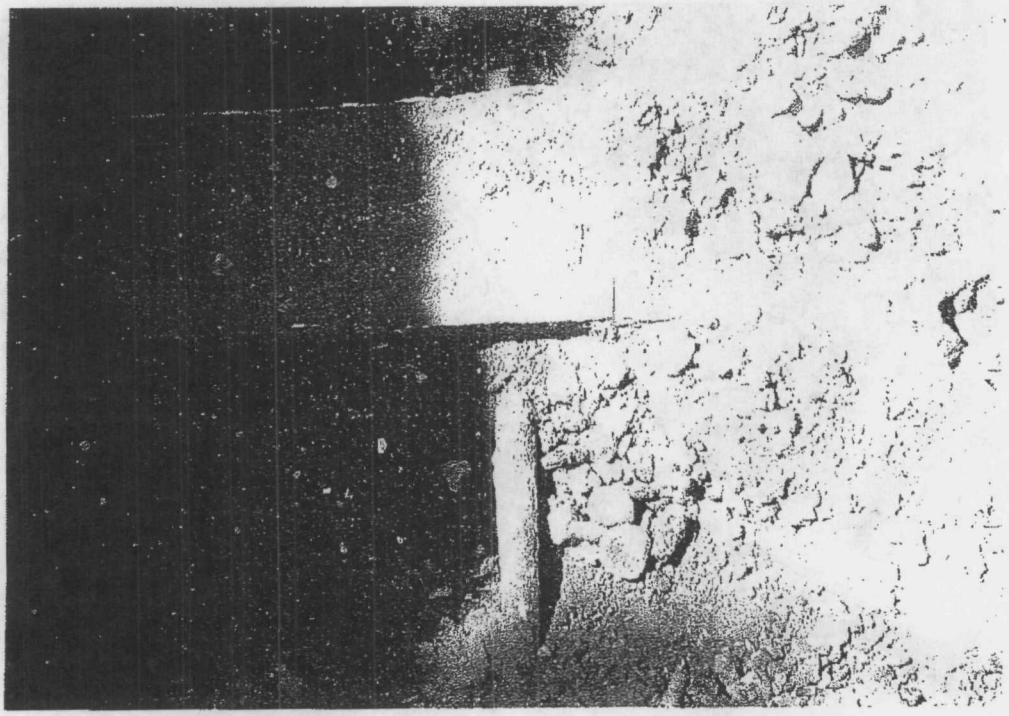
Photograph 18. View of Typical Dockwall Configuration, Looking Southwest from Station 10+85.



Photograph 21. View of Western Anchor Rod End at Station 3+94. Note Lack of Anchor Restraint System.



Photograph 22. View of Interior Steel Sheeting Face at Station 9+50



Photograph 23. View of Anchor Rod to Channel Connection at Station 9+50.